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IPS Quiz 4

Indicate the answer choice that best completes the statement or answers the question.

	1	2	3	4	5	6	7	8	9	10
a										
b										
c										
d										
e										

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IPS Quiz 4

1. At the end of a production run manufacturing rubber gaskets, items are sampled at random and inspected to determine whether the item is acceptable (*A*) or defective (*D*). The plan is to select two items and determine whether each is *A* or *D*. What is the sample space *S* of the outcomes?

   a. $S = \{A \text{ or } D\}$

   b. $S = \{AA, DD\}$

   c. $S = \{AA, AD, DA, DD\}$

   d. This depends on the assignment of probability to the outcomes of the sampling.

   e. This can't be determined until the sample of two items has been collected.

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2. Suppose there are three balls in a box. On one of the balls is the number 1, on another is the number 2, and on the third is the number 3. You select two balls at random and without replacement from the box, and note the two numbers observed. The sample space *S* consists of the three equally likely outcomes {(1, 2), (1, 3), (2, 3)} (disregarding order). Let *X* be the sum of the two balls selected. Which of the following is the correct distribution for *X*?

a.

Value of *X*	1 2 3
Probability	1/3 1/3 1/3

b.

Value of *X*	3 4 5
Probability	1/3 1/3 1/3

c.

Value of *X*	1 2 3
Probability	1/6 2/6 3/6

d.

Value of *X*	3 4 5
Probability	1/6 2/6 3/6

IPS Quiz 4

3. Suppose that the random variable X is continuous and takes its values uniformly over the interval from 0 to 2. What is the value of the probability $P(X \leq 0.4 \text{ or } X > 1.2)$?

a. 0.40
b. 0.20
c. 0.60
d. 0.80
e. 0.50

IPS Quiz 4

4. A shipment of computers received by a retailer consisted of the following configurations of hard drives with 80 or 120 gigabytes, and with 2 or 4 gigabytes of memory.

	Hard drive	
Memory	80 GB	120 GB
2 GB	15	55
4 GB	10	20

A single computer is selected at random from the shipment.

Let *A* be the event that the computer has a hard drive with 80 gigabytes.

Let *B* be the event that the computer has a hard drive with 120 gigabytes.

Let *C* be the event that the computer has 2 gigabytes of memory.

Let *D* be the event that the computer has 4 gigabytes of memory.

What is the probability $P(B \text{ or } C)$?

a. 0.75

b. 0.10

c. 0.70

d. 0.90

e. 0.73

5. Ignoring twins and other multiple births, assume that babies born at a hospital are independent events with the probability that a baby is a boy and the probability that a baby is a girl both equal to 0.5. Define event B = {at least one of the next two babies is a boy}. What is the probability of the complement of event B?

a. 0.125

b. 0.250

c. 0.375

d. 0.500

IPS Quiz 4

6. The amount of snow each county in the United States received last year is an example of a _____ random variable.

a. discrete
b. continuous
c. None of the above

IPS Quiz 4

7. You are taking a basic statistics class. On the first exam, you score poorly and receive only 10 out of 100 points. You decide to get a tutor for the next exam and study quite a bit more. You end up scoring much better and receive 80 out of 100 points. The scores on your first and second exams are considered _____.

a. independent
b. dependent

IPS Quiz 4

8. When the law of large numbers is applied, how many trials are needed to ensure that the mean of an outcome is close to the population mean?

a. 5
b. 10
c. 15
d. It depends on the variability of the random outcomes.

IPS Quiz 4

9. Consider any two events *A* and *B*, such that $P(A) \neq 0$ and $P(B) \neq 0$. Which of the following statements is always FALSE?

a. If events *A* and *B* are independent, then $P(A|B) = P(A)$ and $P(B|A) = P(B)$.
b. If events *A* and *B* are disjoint, then $P(A \text{ and } B) = 0$.
c. If events *A* and *B* are independent, then $P(A \text{ and } B) = 0$.
d. If events *A* and *B* are disjoint, then they are not independent.
e. If events *A* and *B* are independent, then $P(A \text{ and } B) = P(A)P(B)$.

IPS Quiz 4

10. The United States has 10 federal holidays. Each holiday and the date of the holiday in 2016 are listed in the table below.

Friday, January 1	New Year's Day
Monday, January 18	Birthday of Martin Luther King, Jr.
Monday, February 15	Washington's Birthday
Monday, May 30	Memorial Day
Friday, July 4	Independence Day
Monday, September 5	Labor Day
Monday, October 10	Columbus Day
Friday, November 11	Veterans Day
Thursday, November 24	Thanksgiving Day
Monday, December 26	Christmas Day

Suppose you work for a private company that does not observe all the federal holidays. What is the sample space for the number of federal holidays that your company might observe?

a. $S = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$

b. $S = \{\text{Jan, Feb, May, Jul, Sept, Oct, Nov, Dec}\}$

c. $S = \{0\}$

d. $S = \{10\}$

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Answer Key

1. c

2. b

3. c

4. d

5. b

6. b

7. a

8. d

9. c

10. a

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